

60020830-0003 sequence listing.txt  
SEQUENCE LISTING

<110> wun, Tze-Chein  
<120> Novel Recombinant Anticoagulant Proteins  
<130> 60020830-0003  
<140> PCT/US03/17442  
<141> 2003-06-04  
<150> US 06/386,932  
<151> 2002-06-06  
<160> 41  
<170> PatentIn version 3.2  
<210> 1  
<211> 382  
<212> PRT  
<213> Artificial  
<220>  
<223> Fusion protein: human-derived ANV with TAP  
<400> 1

Ala Tyr Asn Arg Leu Cys Ile Lys Pro Arg Asp Trp Ile Asp Glu Cys  
1 5 10 15

Asp Ser Asn Glu Gly Gly Glu Arg Ala Tyr Phe Arg Asn Gly Lys Gly  
20 25 30

Gly Cys Asp Ser Phe Trp Ile Cys Pro Glu Asp His Thr Gly Ala Asp  
35 40 45

Tyr Tyr Ser Ser Tyr Asn Asp Cys Phe Asn Ala Cys Ile Gly Ser Ala  
50 55 60

Gln Val Leu Arg Gly Thr Val Thr Asp Phe Pro Gly Phe Asp Glu Arg  
65 70 75 80

Ala Asp Ala Glu Thr Leu Arg Lys Ala Met Lys Gly Leu Gly Thr Asp  
85 90 95

Glu Glu Ser Ile Leu Thr Leu Leu Thr Ser Arg Ser Asn Ala Gln Arg  
100 105 110

Gln Glu Ile Ser Ala Ala Phe Lys Thr Leu Phe Gly Arg Asp Leu Leu  
115 120 125

Asp Asp Leu Lys Ser Glu Leu Thr Gly Lys Phe Glu Lys Leu Ile Val  
130 135 140

60020830-0003 sequence listing.txt

Ala Leu Met Lys Pro Ser Arg Leu Tyr Asp Ala Tyr Glu Leu Lys His  
145 150 155 160

Ala Leu Lys Gly Ala Gly Thr Asn Glu Lys Val Leu Thr Glu Ile Ile  
165 170 175

Ala Ser Arg Thr Pro Glu Glu Leu Arg Ala Ile Lys Gln Val Tyr Glu  
180 185 190

Glu Glu Tyr Gly Ser Ser Leu Glu Asp Asp Val Val Gly Asp Thr Ser  
195 200 205

Gly Tyr Tyr Gln Arg Met Leu Val Val Leu Leu Gln Ala Asn Arg Asp  
210 215 220

Pro Asp Ala Gly Ile Asp Glu Ala Gln Val Glu Gln Asp Ala Gln Ala  
225 230 235 240

Leu Phe Gln Ala Gly Glu Leu Lys Trp Gly Thr Asp Glu Glu Lys Phe  
245 250 255

Ile Thr Ile Phe Gly Thr Arg Ser Val Ser His Leu Arg Lys Val Phe  
260 265 270

Asp Lys Tyr Met Thr Ile Ser Gly Phe Gln Ile Glu Glu Thr Ile Asp  
275 280 285

Arg Glu Thr Ser Gly Asn Leu Glu Gln Leu Leu Leu Ala Val Val Lys  
290 295 300

Ser Ile Arg Ser Ile Pro Ala Tyr Leu Ala Glu Thr Leu Tyr Tyr Ala  
305 310 315 320

Met Lys Gly Ala Gly Thr Asp Asp His Thr Leu Ile Arg Val Met Val  
325 330 335

Ser Arg Ser Glu Ile Asp Leu Phe Asn Ile Arg Lys Glu Phe Arg Lys  
340 345 350

Asn Phe Ala Thr Ser Leu Tyr Ser Met Ile Lys Gly Asp Thr Ser Gly  
355 360 365

Asp Tyr Lys Lys Ala Leu Leu Leu Leu Ala Gly Glu Asp Asp  
370 375 380

<210> 2  
<211> 378

60020830-0003 sequence listing.txt

<212> PRT  
<213> Artificial

<220>

<223> Fusion protein: human-derived ANV with artificial 6L15 (a variant  
of naturally-occurring bovine pancreatic trypsin inhibitor)

<400> 2

Ala Gln Val Leu Arg Gly Thr Val Thr Asp Phe Pro Gly Phe Asp Glu  
1 5 10 15

Arg Ala Asp Ala Glu Thr Leu Arg Lys Ala Met Lys Gly Leu Gly Thr  
20 25 30

Asp Glu Glu Ser Ile Leu Thr Leu Leu Thr Ser Arg Ser Asn Ala Gln  
35 40 45

Arg Gln Glu Ile Ser Ala Ala Phe Lys Thr Leu Phe Gly Arg Asp Leu  
50 55 60

Leu Asp Asp Leu Lys Ser Glu Leu Thr Gly Lys Phe Glu Lys Leu Ile  
65 70 75 80

Val Ala Leu Met Lys Pro Ser Arg Leu Tyr Asp Ala Tyr Glu Leu Lys  
85 90 95

His Ala Leu Lys Gly Ala Gly Thr Asn Glu Lys Val Leu Thr Glu Ile  
100 105 110

Ile Ala Ser Arg Thr Pro Glu Glu Leu Arg Ala Ile Lys Gln Val Tyr  
115 120 125

Glu Glu Glu Tyr Gly Ser Ser Leu Glu Asp Asp Val Val Gly Asp Thr  
130 135 140

Ser Gly Tyr Tyr Gln Arg Met Leu Val Val Leu Leu Gln Ala Asn Arg  
145 150 155 160

Asp Pro Asp Ala Gly Ile Asp Glu Ala Gln Val Glu Gln Asp Ala Gln  
165 170 175

Ala Leu Phe Gln Ala Gly Glu Leu Lys Trp Gly Thr Asp Glu Glu Lys  
180 185 190

Phe Ile Thr Ile Phe Gly Thr Arg Ser Val Ser His Leu Arg Lys Val  
195 200 205

Phe Asp Lys Tyr Met Thr Ile Ser Gly Phe Gln Ile Glu Glu Thr Ile  
210 215 220

60020830-0003 sequence listing.txt

Asp Arg Glu Thr Ser Gly Asn Leu Glu Gln Leu Leu Leu Ala Val Val  
225 230 235 240

Lys Ser Ile Arg Ser Ile Pro Ala Tyr Leu Ala Glu Thr Leu Tyr Tyr  
245 250 255

Ala Met Lys Gly Ala Gly Thr Asp Asp His Thr Leu Ile Arg Val Met  
260 265 270

Val Ser Arg Ser Glu Ile Asp Leu Phe Asn Ile Arg Lys Glu Phe Arg  
275 280 285

Lys Asn Phe Ala Thr Ser Leu Tyr Ser Met Ile Lys Gly Asp Thr Ser  
290 295 300

Gly Asp Tyr Lys Lys Ala Leu Leu Leu Ala Gly Glu Asp Asp Met  
305 310 315 320

His Pro Asp Phe Cys Leu Glu Pro Pro Tyr Asp Gly Pro Cys Arg Ala  
325 330 335

Leu His Leu Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr  
340 345 350

Phe Tyr Tyr Gly Gly Cys Leu Ala Lys Arg Asn Asn Phe Glu Ser Ala  
355 360 365

Glu Asp Cys Met Arg Thr Cys Gly Gly Ala  
370 375

<210> 3

<211> 376

<212> PRT

<213> Artificial

<220>

<223> Fusion protein:human-derived ANV with synthetic human K-APP

<400> 3

Ala Gln Val Leu Arg Gly Thr Val Thr Asp Phe Pro Gly Phe Asp Glu  
1 5 10 15

Arg Ala Asp Ala Glu Thr Leu Arg Lys Ala Met Lys Gly Leu Gly Thr  
20 25 30

Asp Glu Glu Ser Ile Leu Thr Leu Leu Thr Ser Arg Ser Asn Ala Gln  
35 40 45

60020830-0003 sequence listing.txt

Arg Gln Glu Ile Ser Ala Ala Phe Lys Thr Leu Phe Gly Arg Asp Leu  
50 55 60

Leu Asp Asp Leu Lys Ser Glu Leu Thr Gly Lys Phe Glu Lys Leu Ile  
65 70 75 80

Val Ala Leu Met Lys Pro Ser Arg Leu Tyr Asp Ala Tyr Glu Leu Lys  
85 90 95

His Ala Leu Lys Gly Ala Gly Thr Asn Glu Lys Val Leu Thr Glu Ile  
100 105 110

Ile Ala Ser Arg Thr Pro Glu Glu Leu Arg Ala Ile Lys Gln Val Tyr  
115 120 125

Glu Glu Glu Tyr Gly Ser Ser Leu Glu Asp Asp Val Val Gly Asp Thr  
130 135 140

Ser Gly Tyr Tyr Gln Arg Met Leu Val Val Leu Leu Gln Ala Asn Arg  
145 150 155 160

Asp Pro Asp Ala Gly Ile Asp Glu Ala Gln Val Glu Gln Asp Ala Gln  
165 170 175

Ala Leu Phe Gln Ala Gly Glu Leu Lys Trp Gly Thr Asp Glu Glu Lys  
180 185 190

Phe Ile Thr Ile Phe Gly Thr Arg Ser Val Ser His Leu Arg Lys Val  
195 200 205

Phe Asp Lys Tyr Met Thr Ile Ser Gly Phe Gln Ile Glu Glu Thr Ile  
210 215 220

Asp Arg Glu Thr Ser Gly Asn Leu Glu Gln Leu Leu Leu Ala Val Val  
225 230 235 240

Lys Ser Ile Arg Ser Ile Pro Ala Tyr Leu Ala Glu Thr Leu Tyr Tyr  
245 250 255

Ala Met Lys Gly Ala Gly Thr Asp Asp His Thr Leu Ile Arg Val Met  
260 265 270

Val Ser Arg Ser Glu Ile Asp Leu Phe Asn Ile Arg Lys Glu Phe Arg  
275 280 285

Lys Asn Phe Ala Thr Ser Leu Tyr Ser Met Ile Lys Gly Asp Thr Ser  
290 295 300

60020830-0003 sequence listing.txt

Gly Asp Tyr Lys Lys Ala Leu Leu Leu Ala Gly Glu Asp Asp Glu  
305 310 315 320

Val Cys Ser Glu Gln Ala Glu Thr Gly Pro Cys Arg Ala Met Ile Ser  
325 330 335

Arg Trp Tyr Phe Asp Val Thr Glu Gly Lys Cys Ala Pro Phe Phe Tyr  
340 345 350

Gly Gly Cys Gly Asn Arg Asn Asn Phe Asp Thr Glu Glu Tyr Cys  
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Met Ala Val Cys Gly Ser Ala Ile  
370 375

<210> 4

<211> 459

<212> PRT

<213> Artificial

<220>

<223> Fusion protein: human-derived ANV with KK-TFPI (a human sequence)

<400> 4

Ala Gln Val Leu Arg Gly Thr Val Thr Asp Phe Pro Gly Phe Asp Glu  
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Arg Ala Asp Ala Glu Thr Leu Arg Lys Ala Met Lys Gly Leu Gly Thr  
20 25 30

Asp Glu Glu Ser Ile Leu Thr Leu Leu Thr Ser Arg Ser Asn Ala Gln  
35 40 45

Arg Gln Glu Ile Ser Ala Ala Phe Lys Thr Leu Phe Gly Arg Asp Leu  
50 55 60

Leu Asp Asp Leu Lys Ser Glu Leu Thr Gly Lys Phe Glu Lys Leu Ile  
65 70 75 80

Val Ala Leu Met Lys Pro Ser Arg Leu Tyr Asp Ala Tyr Glu Leu Lys  
85 90 95

His Ala Leu Lys Gly Ala Gly Thr Asn Glu Lys Val Leu Thr Glu Ile  
100 105 110

Ile Ala Ser Arg Thr Pro Glu Glu Leu Arg Ala Ile Lys Gln Val Tyr  
115 120 125

60020830-0003 sequence listing.txt

Glu Glu Glu Tyr Gly Ser Ser Leu Glu Asp Asp Val Val Gly Asp Thr  
130 135 140

Ser Gly Tyr Tyr Gln Arg Met Leu Val Val Leu Leu Gln Ala Asn Arg  
145 150 155 160

Asp Pro Asp Ala Gly Ile Asp Glu Ala Gln Val Glu Gln Asp Ala Gln  
165 170 175

Ala Leu Phe Gln Ala Gly Glu Leu Lys Trp Gly Thr Asp Glu Glu Lys  
180 185 190

Phe Ile Thr Ile Phe Gly Thr Arg Ser Val Ser His Leu Arg Lys Val  
195 200 205

Phe Asp Lys Tyr Met Thr Ile Ser Gly Phe Gln Ile Glu Glu Thr Ile  
210 215 220

Asp Arg Glu Thr Ser Gly Asn Leu Glu Gln Leu Leu Leu Ala Val Val  
225 230 235 240

Lys Ser Ile Arg Ser Ile Pro Ala Tyr Leu Ala Glu Thr Leu Tyr Tyr  
245 250 255

Ala Met Lys Gly Ala Gly Thr Asp Asp His Thr Leu Ile Arg Val Met  
260 265 270

Val Ser Arg Ser Glu Ile Asp Leu Phe Asn Ile Arg Lys Glu Phe Arg  
275 280 285

Lys Asn Phe Ala Thr Ser Leu Tyr Ser Met Ile Lys Gly Asp Thr Ser  
290 295 300

Gly Asp Tyr Lys Lys Ala Leu Leu Leu Ala Gly Glu Asp Asp Met  
305 310 315 320

His Ser Phe Cys Ala Phe Lys Ala Asp Asp Gly Pro Cys Lys Ala Ile  
325 330 335

Met Lys Arg Phe Phe Asn Ile Phe Thr Arg Gln Cys Glu Glu Phe  
340 345 350

Ile Tyr Gly Gly Cys Glu Gly Asn Gln Asn Arg Phe Glu Ser Leu Glu  
355 360 365

Glu Cys Lys Lys Met Cys Thr Arg Asp Asn Ala Asn Arg Ile Ile Lys  
370 375 380

60020830-0003 sequence listing.txt

Thr Thr Leu Gln Gln Glu Lys Pro Asp Phe Cys Phe Leu Glu Glu Asp  
385 390 395 400

Pro Gly Ile Cys Arg Gly Tyr Ile Thr Arg Tyr Phe Tyr Asn Asn Gln  
405 410 415

Thr Lys Gln Cys Glu Arg Phe Lys Tyr Gly Gly Cys Leu Gly Asn Met  
420 425 430

Asn Asn Phe Glu Thr Leu Glu Glu Cys Lys Asn Ile Cys Glu Asp Gly  
435 440 445

Pro Asn Gly Phe Gln Val Asp Asn Tyr Gly Thr  
450 455

<210> 5  
<211> 1149  
<212> DNA  
<213> Artificial

<220>  
<223> Fusion gene of human-derived ANV with TAP

<400> 5  
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ccggaagacc acaccgggtgc tgactactac tcctcctaca acgactgctt caacgcttgc 180  
atcggatccg cacaggttct cagaggcaact gtgactgact tccctggatt tgatgagcgg 240  
gctgatgcag aaactcttcg gaaggctatg aaaggcttgg gcacagatga ggagagcatc 300  
ctgactctgt tgacatcccg aagtaatgct cagcgccagg aaatctctgc agcttttaag 360  
actctgttttgcagggatct tctggatgac ctgaaatcag aactaacttgg aaaatttggaa 420  
aaattaaatttgcagggatct tggctctgtat gaaaccctct cggctttatg atgcttatgactgaaacat 480  
gccttgaagg gagctggaaac aaataaaaaa gtactgacag aaattattgc ttcaaggaca 540  
cctgaagaac tgagagccat caaacaagtt tatgaagaag aatatggctc aagcctggaa 600  
gatgacgtgg tgggggacac ttcagggtac taccagcggta tttgggtgt ttccttcag 660  
gctaacagag accctgatgc tggaatttgcat gaagctcaag ttgaacaaga tgctcaggct 720  
ttatattcagg ctggagaact taaatggggg acagatgaag aaaagtttat caccatctt 780  
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gctgttgtga aatctatttcg aagtataacct gcctacccctt cagagaccctt ctattatgct 960

## 60020830-0003 sequence listing.txt

atgaagggag	ctggacaga	tgatcatacc	ctcatcagag	tcatggttc	caggagttag	1020
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gatgactaa						1149

&lt;210&gt; 6

&lt;211&gt; 1137

&lt;212&gt; DNA

&lt;213&gt; Artificial

&lt;220&gt;

&lt;223&gt; Fusion gene of human-derived ANV with artificial 6L15, which is a variant of naturally occurring bovine pancreatic trypsin inhibitor

&lt;400&gt; 6

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ggcagggatc	ttctggatga	cctgaaatca	gaactaactg	aaaaatttga	aaaattaatt	240
gtggctctga	tgaaaccctc	tcggcttat	gatgcttatg	aactgaaaca	tgccttgaag	300
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ctgagagcca	tcaaacaagt	ttatgaagaa	aatatggct	caagcctgga	agatgacgtg	420
gtggggaca	cttcaggta	ctaccagcg	atgttggtgg	tttccttca	ggctaacaga	480
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aaatctattc	gaagtatacc	tgcctacctt	gcagagaccc	tctattatgc	tatgaaggga	780
gctggacag	atgatcatac	cctcatcaga	gtcatggtt	ccaggagtga	gattgatctg	840
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tacttctaca	atgcaaaggc	aggcctgtgt	cagaccttct	actacggcgg	ttgcctggct	1080
aagcgtaaca	acttcgaatc	cgcgaaagac	tgcatgcgta	cttgcggtgg	tgcttaa	1137

&lt;210&gt; 7

&lt;211&gt; 1131

&lt;212&gt; DNA

&lt;213&gt; Artificial

60020830-0003 sequence listing.txt

<220>  
<223> Fusion gene of human-derived ANV with synthetic human K-APP gene  
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ttgacatccc gaagtaatgc tcagcgccag gaaatctctg cagctttaa gactctgttt 180  
ggcagggatc ttctggatga cctgaaatca gaactaactg gaaaatttga aaaattaatt 240  
gtggctctga tgaaaccctc tcggcttat gatgcttatg aactgaaaca tgccttgaag 300  
ggagctggaa caaatgaaaa agtactgaca gaaattattt gttcaaggac acctgaagaa 360  
ctgagagcca tcaaacaagt ttatgaagaa gaatatggct caagcctgga agatgacgtg 420  
gtggggaca cttcagggta ctaccagcgg atgttggtgg ttctccttca ggctaacaga 480  
gaccctgatg ctggatttga tgaagctcaa gttgaacaag atgctcaggc tttattttag 540  
gctggagaac ttaaatgggg gacagatgaa gaaaagttt tcaccatctt tggAACACGA 600  
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aatctatttca gaagtataacc tgcctacctt gcagagaccc tctattatgc tatgaaggaa 780  
gctggacag atgatcatac cctcatcaga gtcatggttt ccaggagtga gattgatctg 840  
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ggagatacat ctggggacta taagaaagct cttctgctgc tcgctggaga agatgacgag 960  
gtttgttctg agcaagctga gactggtcca tgttagagcta tgatttctag atggtaattc 1020  
gacgttactg agggtaagtg tgctccattt ttctacggtg gttgtggtgg taacagaaac 1080  
aacttcgaca ctgaggagta ctgtatggct gtttgggtt ctgctattta a 1131

<210> 8  
<211> 1380  
<212> DNA  
<213> Artificial

<220>  
<223> Fusion gene of human-derived ANV with KK-TFPI, which is a human sequence

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ttgacatccc gaagtaatgc tcagcgccag gaaatctctg cagctttaa gactctgttt 180  
ggcagggatc ttctggatga cctgaaatca gaactaactg gaaaatttga aaaattaatt 240  
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60020830-0003 sequence listing.txt

ggagctggaa	caaataaaaa	agtactgaca	gaaattattt	cttcaaggac	acctgaagaa	360
ctgagagcca	tcaaacaagt	ttatgaagaa	aatatggct	caagcctgga	agatgacgtg	420
gtggggaca	cttcagggta	ctaccagcgg	atgttggtgg	ttctccttca	ggctaacaga	480
gaccctgatg	ctggaattga	tgaagctcaa	gttgaacaag	atgctcaggc	tttatttcag	540
gctggagaac	ttaaatgggg	gacagatgaa	gaaaagttt	tcaccatctt	tggAACACGA	600
agtgtgtctc	atttgagaaa	ggtgtttgac	aagtacatga	ctatatcagg	atttcaaatt	660
gaggaaacca	ttgaccgcga	gacttctggc	aatttagagc	aactactcct	tgctgttg	720
aaatctattc	gaagtataacc	tgcctacctt	gcagagaccc	tctattatgc	tatgaaggga	780
gctggacag	atgatcatac	cctcatcaga	gtcatggttt	ccaggagtga	gattgatctg	840
tttaacatca	ggaaggagtt	taggaagaat	tttgcacactt	ctctttattt	catgattaag	900
ggagatacat	ctggggacta	taagaaagct	cttctgctgc	tcgctggaga	agatgacatg	960
cattcatttt	gtgcattcaa	ggcggatgat	ggcccatgta	aagcaatcat	gaaaagattt	1020
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cagaatcgat	ttgaaagtct	ggaagagtgc	aaaaaaatgt	gtacaagaga	taatgcacac	1140
aggattataa	agacaacatt	gcaacaagaa	aagccagatt	tctgctttt	ggaagaagat	1200
cctggaatat	gtcgaggtta	tattaccagg	tatTTTata	acaatcagac	aaaacagtgt	1260
gaacgtttca	agtatggtgg	atcgctggc	aatatgaaca	atTTTgagac	actggaagaa	1320
tgcaagaaca	tttgtgaaga	tggtccgaat	ggtttccagg	tggataatta	tggAACCTAA	1380

<210> 9  
 <211> 960  
 <212> DNA  
 <213> Homo sapiens

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	ttgacatccc	gaagtaatgc	tcagcgccag	gaaatctctg	cagctttaa	gactctgttt	180
	ggcagggatc	ttctggatga	cctgaaatca	gaactaactg	gaaaatttga	aaaattaatt	240
	gtggctctga	tgaaaccctc	tcggcttat	gatgcttatg	aactgaaaca	tgccttgaag	300
	ggagctggaa	caaataaaaa	agtactgaca	gaaattattt	cttcaaggac	acctgaagaa	360
	ctgagagcca	tcaaacaagt	ttatgaagaa	aatatggct	caagcctgga	agatgacgtg	420
	gtggggaca	cttcagggta	ctaccagcgg	atgttggtgg	ttctccttca	ggctaacaga	480
	gaccctgatg	ctggaattga	tgaagctcaa	gttgaacaag	atgctcaggc	tttatttcag	540
	gctggagaac	ttaaatgggg	gacagatgaa	gaaaagttt	tcaccatctt	tggAACACGA	600

60020830-0003 sequence listing.txt

agtgtgtctc	atttgagaaa	ggtgttgac	aagtacatga	ctatatacagg	atttcaaatt	660
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aaatcttattc	gaagtataacc	tgcctacctt	gcagagaccc	tctattatgc	tatgaaggga	780
gctggacacag	atgatcatac	cctcatcaga	gtcatggttt	ccaggagtga	gattgatctg	840
tttaacatca	ggaaggagtt	taggaagaat	tttgcacact	ctctttattc	catgattaag	900
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<210> 10  
<211> 319  
<212> PRT  
<213> Homo sapiens  
<400> 10

Ala Gln Val Leu Arg Gly Thr Val Thr Asp Phe Pro Gly Phe Asp Glu  
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Arg Ala Asp Ala Glu Thr Leu Arg Lys Ala Met Lys Gly Leu Gly Thr  
20 25 30

Asp Glu Glu Ser Ile Leu Thr Leu Leu Thr Ser Arg Ser Asn Ala Gln  
35 40 45

Arg Gln Glu Ile Ser Ala Ala Phe Lys Thr Leu Phe Gly Arg Asp Leu  
50 55 60

Leu Asp Asp Leu Lys Ser Glu Leu Thr Gly Lys Phe Glu Lys Leu Ile  
65 70 75 80

Val Ala Leu Met Lys Pro Ser Arg Leu Tyr Asp Ala Tyr Glu Leu Lys  
85 90 95

His Ala Leu Lys Gly Ala Gly Thr Asn Glu Lys Val Leu Thr Glu Ile  
100 105 110

Ile Ala Ser Arg Thr Pro Glu Glu Leu Arg Ala Ile Lys Gln Val Tyr  
115 120 125

Glu Glu Glu Tyr Gly Ser Ser Leu Glu Asp Asp Val Val Gly Asp Thr  
130 135 140

Ser Gly Tyr Tyr Gln Arg Met Leu Val Val Leu Leu Gln Ala Asn Arg  
145 150 155 160

Asp Pro Asp Ala Gly Ile Asp Glu Ala Gln Val Glu Gln Asp Ala Gln  
165 170 175

60020830-0003 sequence listing.txt

Ala Leu Phe Gln Ala Gly Glu Leu Lys Trp Gly Thr Asp Glu Glu Lys  
180 185 190

Phe Ile Thr Ile Phe Gly Thr Arg Ser Val Ser His Leu Arg Lys Val  
195 200 205

Phe Asp Lys Tyr Met Thr Ile Ser Gly Phe Gln Ile Glu Glu Thr Ile  
210 215 220

Asp Arg Glu Thr Ser Gly Asn Leu Glu Gln Leu Leu Leu Ala Val Val  
225 230 235 240

Lys Ser Ile Arg Ser Ile Pro Ala Tyr Leu Ala Glu Thr Leu Tyr Tyr  
245 250 255

Ala Met Lys Gly Ala Gly Thr Asp Asp His Thr Leu Ile Arg Val Met  
260 265 270

Val Ser Arg Ser Glu Ile Asp Leu Phe Asn Ile Arg Lys Glu Phe Arg  
275 280 285

Lys Asn Phe Ala Thr Ser Leu Tyr Ser Met Ile Lys Gly Asp Thr Ser  
290 295 300

Gly Asp Tyr Lys Lys Ala Leu Leu Leu Cys Gly Glu Asp Asp  
305 310 315

<210> 11  
<211> 33  
<212> DNA  
<213> Artificial

<220>  
<223> ANV reverse primer

<400> 11  
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33

<210> 12  
<211> 31  
<212> DNA  
<213> Artificial

<220>  
<223> ANV forward primer

<400> 12  
gatcgatcc agtctggtcc tgcttcacct t

31

<210> 13

60020830-0003 sequence listing.txt

<211> 32  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide used to generate ANV cDNA mutation of Cys-to-Ala at position 315

<400> 13  
cgtgacatgc atgtcatctt ctccagcgag ca

32

<210> 14  
<211> 960  
<212> DNA  
<213> Artificial

<220>  
<223> Sequence encoding human ANV with Cys-to-Ala mutation at position 315

<400> 14  
gcacagggttc tcagaggcac tgtgactgac ttccctggat ttgatgagcg ggctgatgca 60  
gaaactcttc ggaaggctat gaaaggctt ggcacagatg aggagagcat cctgactctg 120  
ttgacatccc gaagtaatgc tcagcgccag gaaatctctg cagctttaa gactctgtt 180  
ggcagggatc ttctggatga cctgaaatca gaactaactg gaaaatttga aaaattaatt 240  
gtggctctga taaaaccctc tcggcttat gatgctttag aactgaaaca tgccttgaag 300  
ggagctggaa caaatgaaaa agtactgaca gaaattttag cttcaaggac acctgaagaa 360  
ctgagagcca tcaaacaagt ttatgaagaa gaatatggct caagcctgga agatgacgt 420  
gtggggaca cttcagggta ctaccagcgg atgttggtgg ttcccttca ggctaacaga 480  
gaccctgatg ctggattta tgaagctcaa gttgaacaag atgctcaggc tttatttcag 540  
gctggagaac ttaatgggg gacagatgaa gaaaagttt tcaccatctt tggAACACGA 600  
agtgtgtctc atttgagaaa ggtgtttgac aagtacatga ctatattcagg atttcaaatt 660  
gaggaaacca ttgaccgcga gacttctggc aatttagagc aactactcct tgctgttg 720  
aaatcttattc gaagtataacc tgcctacctt gcagagaccc tctattatgc tatgaaggga 780  
gctggacag atgatcatac cctcatcaga gtcatggttt ccaggagtga gattgatctg 840  
tttaacatca ggaaggagtt taggaagaat tttgccacct ctcttattc catgattaag 900  
ggagatacat ctggggacta taagaaagct cttctgctgc tcgctggaga agatgactaa 960

<210> 15  
<211> 64  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide, first of three forward primers used to generate recombinant 6L15 gene

60020830-0003 sequence listing.txt

<400> 15  
tccggacttc tgcctggaac cgccgtacga cggtccgtgc cgtgctctgc acctgcgtta 60  
cttc 64

<210> 16  
<211> 60  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide, second of three forward primers used  
to generate recombinant 6L15

<400> 16  
tacaatgc当地 aggcaggcct gtgtcagacc ttctactacg gcggttgc当地 ggctaagcgt 60

<210> 17  
<211> 50  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide, third of three forward primers used to  
generate recombinant 6L15 gene

<400> 17  
aacaacttc当地 aatccgc当地 acactgc当地 cgtacttgcg gtggtgctta 50

<210> 18  
<211> 63  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide, first of three reverse primers used to  
generate recombinant 6L15 gene

<400> 18  
acgcagggtc当地 agagcacggc acggaccgtc gtacggcggt tccaggc当地 agtccggatg 60  
cat 63

<210> 19  
<211> 60  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide, second of three reverse primers used  
to generate recombinant 6L15 gene

<400> 19  
agccaggcaa ccgccc当地 agaaggctc当地 acacaggcct gcctttgc当地 tgtagaagta 60

<210> 20  
<211> 60

60020830-0003 sequence listing.txt

<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide, third of three reverse primers used to generate recombinant 6L15 gene

<400> 20  
agcttaagca ccaccgcaag tacgcattgca gtcttccgcg gattcgaagt tgttacgctt 60

<210> 21  
<211> 177  
<212> DNA  
<213> Artificial

<220>  
<223> synthetic 6L15 gene

<400> 21  
gctccggact tctgcctgga accgcccgtac gacggtccgt gccgtgctct gcacacctgcgt 60  
tacttctaca atgcaaaggc aggcctgtgt cagaccttct actacggcgg ttgcctggct 120  
aagcgtaaca acttcgaatc cgcggaaagac tgcatgcgta cttgcgggtgg tgcttaa 177

<210> 22  
<211> 186  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic, derived from Ornithodoros moubata gene

<400> 22  
gcttacaacc gtctgtgcat caaaccgcgt gactggatcg acgaatgcga ctccaaacgaa 60  
ggtgttgaac gtgcttactt ccgtaacggt aaaggtggtt gcgactcctt ctggatctgc 120  
ccggaagacc acaccgggtgc tgactactac tcctcctacc gtgactgctt caacgcttgc 180  
atctaa 186

<210> 23  
<211> 122  
<212> DNA  
<213> Artificial

<220>  
<223> Forward synthetic oligonucleotide for generating synthetic K-APP gene with flanking sequences

<400> 23  
ggccctaccc cacagatacg gagttgccac cactgaaact tgaggttggt agagagggttt 60  
gttctgagca agctgagact ggtccatgta gagctatgtat ttcttagatgg tacttcgacg 120  
tt 122

<210> 24

60020830-0003 sequence listing.txt

<211> 117

<212> DNA

<213> Artificial

<220>

<223> Forward synthetic oligonucleotide for generating synthetic K-APP gene with flanking sequences

<400> 24

actgagggtta agtgtgctcc attcttctac ggtggttgtg gtggtaacag aaacaacttc 60  
gacactgagg agtactgtat ggctgtttgt ggttctgcta tttaaatgca ttgatga 117

<210> 25

<211> 124

<212> DNA

<213> Artificial

<220>

<223> Reverse synthetic oligonucleotide for generating synthetic K-APP gene with flanking sequences

<400> 25

ctcagtaacg tcgaagtacc atctagaaat catagctcta catggaccag tctcagcttg 60  
ctcagaacaa acctctctaa caacctcaag tttcagtggg ggcaactccg tatctgtggg 120

gtag 124

<210> 26

<211> 115

<212> DNA

<213> Artificial

<220>

<223> Reverse synthetic oligonucleotide for generating synthetic K-APP gene with flanking sequences

<400> 26

agtttcatca atgcatttaa atagcagaac cacaaacagc catacagtac tcctcagtgt 60

cgaagttgtt tctgttacca ccacaaccac cgtagaagaa tggagcacac ttacc 115

<210> 27

<211> 174

<212> DNA

<213> Artificial

<220>

<223> Synthetic K-APP gene, derived from human sequence

<400> 27

gaggtttgtt ctgagcaagc tgagactggc ccatgttagag ctatgatttc tagatggtac 60

ttcgacgtta ctgagggtaa gtgtgctcca ttcttctacg gtggttgtgg tggtaacaga 120

aacaacttcg acactgagga gtactgtatg gctgtttgtg gttctgctat ttaa 174

<210> 28

60020830-0003 sequence listing.txt

<211> 30  
<212> DNA  
<213> Artificial

<220>  
<223> primer

<400> 28  
ggaattccat atggcacagg ttctcagagg

30

<210> 29  
<211> 24  
<212> DNA  
<213> Artificial

<220>  
<223> primer

<400> 29  
ccaatgcatg tcatcttctc cagc

24

<210> 30  
<211> 24  
<212> DNA  
<213> Artificial

<220>  
<223> primer

<400> 30  
ccaatgcatc cggacttctg cctg

24

<210> 31  
<211> 24  
<212> DNA  
<213> Artificial

<220>  
<223> primer

<400> 31  
ccaatgcatt cattttgtgc attc

24

<210> 32  
<211> 27  
<212> DNA  
<213> Artificial

<220>  
<223> primer

<400> 32  
acgcgtcgac ttaagcacca ccgcaag

27

<210> 33  
<211> 29  
<212> DNA  
<213> Artificial

60020830-0003 sequence listing.txt

<220>  
<223> primer  
  
<400> 33  
acgcgtcgac ttagttcca taattatcc 29  
  
<210> 34  
<211> 30  
<212> DNA  
<213> Artificial  
  
<220>  
<223> primer  
  
<400> 34  
ggaattccat atggcttaca accgtctgtg 30  
  
<210> 35  
<211> 27  
<212> DNA  
<213> Artificial  
  
<220>  
<223> primer  
  
<400> 35  
cgggatccga tgcaagcgtt gaagcag 27  
  
<210> 36  
<211> 26  
<212> DNA  
<213> Artificial  
  
<220>  
<223> primer  
  
<400> 36  
cgggatccgc acaggttctc agaggc 26  
  
<210> 37  
<211> 29  
<212> DNA  
<213> Artificial  
  
<220>  
<223> primer  
  
<400> 37  
acgcgtcgac ttagtcatct tctccagcg 29  
  
<210> 38  
<211> 31  
<212> DNA  
<213> Artificial  
  
<220>  
<223> Primer designed for generating PCR fragment of interest for  
Page 19

60020830-0003 sequence listing.txt  
cloning into vector pPIC9

<400> 38  
ccgctcgaga aaagagcaca ggttctcaga g 31

<210> 39  
<211> 33  
<212> DNA  
<213> Artificial

<220>  
<223> Primer designed for generating PCR fragment of interest for cloning into yeast expression vector pPIC9

<400> 39  
ataagaatgc ggccgcttaa atagcagaac cac 33

<210> 40  
<211> 24  
<212> DNA  
<213> Artificial

<220>  
<223> Primer designed for generating PCR fragment of interest for cloning into yeast expression vector pPIC9

<400> 40  
cgcgatatatca tcttctccag cgag 24

<210> 41  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> Primer designed for generating PCR fragment of interest for cloning into yeast expression vector pPIC9

<400> 41  
gaggtttgtt ctgagcaagc 20